

Appl. No. 10/789,847
Amdt. dated November 4, 2005
Reply to Office action of May 4, 2005

This listing of claims will replace all prior versions, and listings, of claims in the application:

CLAIMS

Claims 1-10 canceled.

11. (currently amended) A method of forming a solid electrolyte cell portion of an automotive lambda oxygen sensor, the method comprising forming a solid, unfired, thimble-shaped ceramic body, thereafter depositing a porous ceramic layer on an outer surface of the unfired body, thereafter heating the body to densify the body and to form a hard, porous ceramic layer on the outer surface of the body, thereafter activating the porous layer on the first outer surface of the body to form a plurality of growth points for a conductive layer on the first outer surface, thereafter growing a first electrode by electroless plating of a conductive layer on the activated porous layer on the outer surface of the body, and, in a desired order, forming a second electrode on an inner surface of the body.

12. (original) The method of claim 11 wherein the body is formed by uniaxially compressing a zirconia powder into a thimble.

13. (currently amended) The method of claim 11 wherein activating the porous layer on the first surface comprises wicking a metal salt carried by a volatile liquid into the porous layer.

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14. (currently amended) The method of claim 11 wherein growing a first electrode comprises immersion of the porous layer on the first surface in an unstable solution of a salt of a precious metal.

15. (currently amended) The method of claim 14 wherein the unstable solution further comprises a reducing agent.

16. (original) The method of claim 15 wherein the reducing agent comprises hydrazine.

17. (original) The method of claim 15 wherein the salt is hexachloroplatinic acid.

18. (currently amended) The method of claim 15 13 wherein the solution ~~comprises liquid carries~~ a platinum salt ~~in a volatile solvent~~.

19. (currently amended) The method of claim 18 wherein the ~~volatile solvent~~ liquid comprises acetone.

20. (new) The method of claim 13 wherein the liquid is organic.

21. (new) The method of claim 20 wherein the liquid is volatile.

22. (new) The method of claim 13 wherein the liquid wets the ceramic.

23. (new) The method of claim 11 wherein depositing a ceramic layer comprises immersion of a closed end of the thimble-shaped ceramic body in a slurry of ceramic powder and ceramic granules.

24. (new) The method of claim 23 wherein, during the heating of the body to densify the body, the ceramic granules shrink to form voids in the porous layer.

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25. (new) The method of claim 13 including a step, after wicking the liquid into the porous layer, of heating the substrate to drive off the liquid and reduce the salt to a 0.01 to 0.5 micron layer of metal with numerous unplated areas.

26. (new) The method of claim 11 wherein the cell is a body of an automotive lambda oxygen sensor.

27. (new) The method of claim 11 wherein the method further comprises a step of drilling an axial cavity in the body, before the step of firing the body to densify it.

28. (new) The method of claim 27 wherein the body is formed by uniaxially compressing a zirconia powder into a thimble having a tapered bore, and then drilling out the tapered bore to form a substantially cylindrical cavity.

29. (new) The method of claim 13 wherein wicking the liquid into the pores of the body comprises dipping the body in a liquid carrying the metal salt.

30. (new) The method of claim 29 wherein the metal salt is a platinum salt.